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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/820,493	04/08/2004	Cyrus Behroozi	TROPOS-1010-1	7285

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EXAMINER

JACKSON, BLANE J

ART UNIT	PAPER NUMBER
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2618

MAIL DATE	DELIVERY MODE
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08/24/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/820,493

Applicant(s)

BEHROOZI, CYRUS

Examiner

Blane J. Jackson

Art Unit

2618

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11, 14-22, 27 and 28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 14-22, 27 and 28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 12, 13 and 23-26 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

The Information Disclosure Statement filed 08 April 2004 has been made of record.

Election/Restrictions

Claims 12, 13 and 23-26 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 08 June 2007. Note the Examiner amends the election such that claims 27 and 28 join the elected claims since they indicate dependency on elected claims 19 and 20 respectively.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang (US 2002/0061729) in view of Uesugi (US 6,804,491).

As to claim 1, Zhang teaches a wireless access node comprising:

Art Unit: 2618

A first radio operable to transmit/receive on one of at least N transmission channels (figures 1 and 2, paragraphs 0045-0047, a fixed wireless network extender (FWNE) comprising multiple same or different network radios that work as a multifunction fixed wireless networking node or repeater node),

A second radio operable to transmit/receive on another one of the at least N transmission channels wherein N is greater than 2 (figure 2, paragraph 0047, two wireless networking radio units (102 and 112)).

Zhang teaches the wireless network extender comprises a radio control unit (163) to control the physical layer performance of each radio, paragraph 0046, but is silent as to a first and second filter bank of less than N filters for filtering a transmit/receive signal of the respective first and second radio.

Uesugi teaches a plurality of repeaters provided with filters for passing channel frequencies of less than the plurality of transmission channels serviced by the communicating or adjacent cellular base stations, figures 1-3, Abstract and column 3, lines 1-48. Uesugi discloses first and second base stations use frequencies F1, F2, F3 and F4 where the associated repeaters to the first base station are configured for passing frequencies, or channels, F1 and F2 and the repeaters associated with the second base station pass different frequencies such as F3 and F4, column 3, lines 49-67.

It would have been obvious to one of ordinary skill in the art at the time of the invention to select the filter banks in the individual radio units of Zhang to pass a subset

Art Unit: 2618

of the total transmission channel frequencies to reduce interference of overlapping signals from adjacent wireless network radios.

As to claim 2 with respect to claim 1, Zhang teaches the first filter band and the second filter bank are substantially electro-magnetically isolated (paragraph 0051, with respect to figure 1, the radio units are physically separately installed devices with independent controls of the physical layer performance of each and are consequently configured to be substantially electro-magnetically isolated to avoid mutual interference).

As to claim 3 with respect to claim 1, Uesugi of Zhang teaches the combination of the first radio and the second radio are operable to transmit/receive on all N transmission channels (figure 3, column 3, lines 49-62, the combination of two repeaters, each available to operate on a different subset of all N transmission channels).

As to claim 4 with respect to claim 1, Zhang teaches the access node is in communication with a first device and a second device, the first radio being in communication with the first device and the second radio being in communication with the second device (figure 2, paragraph 0047, radio unit (102) communicating to the radio of network (121) and radio unit (112) communicating to the radio of network (222)).

Art Unit: 2618

As to claim 5 with respect to claim 4, Zhang teaches the communication of the access node to the first device and the second device is reversible so that the first radio is in communication with the second device and the second radio is in communication with the first device (paragraphs 0045-0047, the FWNE device comprises a radio control unit (163) which controls the physical layer performance or tuning of each radio unit).

As to claim 6 with respect to claim 5, Zhang teaches the access node is within a mesh network and the first radio is in communication with at least one of the first device and the second device depending upon a selected mesh network routing (paragraphs 0005 and 0046, multipoint to multipoint or mesh topology where the network is formed with more than one AP and other wireless networking devices).

As to claim 7 with respect to claim 6, Zhang teaches the second radio is in communication with at least one of the first device and the second device depending upon a selected mesh network routing (paragraphs 0005, 0046 and 0047, the radio units of the FWNE device are used for routing, bridging and networking management functions where with respect to routing in a mesh network, communicate with their direct neighbors and forward packets to their various destinations using any one of many possible routes).

Art Unit: 2618

As to claim 8 with respect to claim 1, Uesugi of Zhang modified teaches $N=3$ and the first filter bank comprises 2 filters and the second filter band comprises 2 filters (figures 2 and 3, column 3, lines 30-67, two embodiments are taught where the base station utilizes three or four transmission channels and the associated repeaters are configured with one or two filters for operating on one or two transmission channels).

As to claim 9 with respect to claim 8, Uesugi of Zhang modified teaches at least one of the filters of the first filter bank filters signals of a different transmission channel than at least one of the filters of the second filter bank (figure 3, column 3, lines 49-67, the plurality of repeaters are configured for passing different subsets of the total transmission channels).

As to claims 10 and 11 with respect to claim 8, Zhang of Zhang modified teaches each filter of the first filter bank has a corresponding complementary filter within the second filter bank if the first filter rejects frequencies of a desired pass band of the second filter and the second filter rejects frequencies of a desired pass band of the first filter (paragraph 0045 and 0051, the filters or channels of the FWNE radio units are appropriately selected for the FWNE/ access node to route or bridge the same or different channel network packets).

Claims 12 and 13 are withdrawn.

Art Unit: 2618

Claims 14-22, 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang (US 2002/0061729) in view of Uesugi (US 6,804,491) and Bandeira et al. (US 2002/0072329).

As to claim 14, Zhang teaches a multifunction wireless networking node comprising:

A first radio operable to transmit/receive on one of at least N transmission channels (figures 1 and 2, paragraphs 0045-0047, a fixed wireless network extender (FWNE) comprising multiple same or different network radios that work as a multifunction fixed wireless networking node or repeater node),

A second radio operable to transmit/receive on another one of the at least N transmission channels wherein N is greater than 2 (figure 2, paragraph 0047, two wireless networking radio units (102 and 112)).

Zhang teaches the wireless network extender comprises a radio control unit (163) to control the physical layer performance of each radio, paragraph 0046, but is silent as to a first and second filter bank of less than N filters for filtering a transmit/receive signal of the respective first and second radio.

Uesugi teaches a plurality of repeaters provided with filters for passing channel frequencies of less than the plurality of transmission channels serviced by the communicating or adjacent cellular base stations, figures 1-3, Abstract and column 3, lines 1-48. Uesugi discloses first and second base stations use frequencies F1, F2, F3 and F4 where the associated repeaters to the first base station are configured for passing frequencies, or channels, F1 and F2 and the repeaters associated with the

second base station pass different frequencies such as F3 and F4, column 3, lines 49-67.

It would have been obvious to one of ordinary skill in the art at the time of the invention to select the filter banks in the individual radio units of Zhang to pass a subset of the total transmission channel frequencies to reduce interference of overlapping signals from adjacent wireless network radios.

Zhang of Zhang modified teaches a multifunction fixed wireless networking node extender also suitable for application in a multipoint to multipoint system, paragraphs 0005 and 0009, but does not clearly teach the access node is applied to a wireless mesh network comprising a plurality of wireless access nodes, each in communication with at least one other wireless access node.

Bandeira teaches a mesh network comprising a plurality of fixed wireless access nodes using frequency diversity to allow multiple nodes to transmit simultaneously in the same geographical area without collision, figures 1 and 2, paragraphs 0012, 0017-0020 and 0034. Bandeira further discloses the root location access mode comprises two or more transceivers, each one equipped with a sector antenna with different channels to avoid interference, paragraph 0057.

Since Bandeira discloses an access node may be configured with two radio units, it would have been obvious to one of ordinary skill in the art at the time of the invention to introduce the fixed wireless access node of Zhang modified within a mesh network as identified by Bandeira for the access nodes to communicate with their direct

neighbors using any one of many possible routes to easily reach hidden locations through multiple hops.

As to claim 15 with respect to claim 14, Bandeira of Zhang modified teaches the mesh network comprises a gateway and the access nodes allow a client to communicate with at least one access node providing communication between the client and gateway (paragraph 0036, the mesh network topology may be further connected to a network such as the Internet to provide a communication link between the Internet and the client wherein a gateway is a common bridge between the mesh network and the Internet).

As to claim 16 with respect to claim 14, Zhang of Zhang modified teaches the first radio is operable to communicate with a first device and a second device within the mesh network and the second radio is operable to communicate with the first device and the second device within the mesh network (figure 2, paragraph 0047, radio unit (102) communicating to the radio of network (121) and radio unit (112) communicating to the radio of network (222)).

As to claim 17 with respect to claim 14, Bandeira of Zhang modified teaches depending upon a selected routing within the mesh network, the first radio is in communication with at least one of the first device and the second device and the second radio is in communication with the other of the first device and the second

Art Unit: 2618

device (figure 1, paragraphs 0040-0041 and 0047, network deployment strategy builds a natural tree topology where the inbound and outbound transmissions need to be on different channels even though the branching nodes are configured as simple repeaters).

As to claim 18 with respect to claim 17, Bandeira of Zhang modified teaches the selected routing is dynamic (paragraph 0012 and 0058, reconfigure the nodes and routes to meet network capacity).

As to claim 19 with respect to claim 14, Bandeira of Zhang modified teaches the downstream data flows from the gateway to the client and upstream data flows from the client to the gateway (paragraph 0041 and 0055, upstream and downstream traffic towards and away from the root access node or subsequent network gateway).

As to claim 27 with respect to claim 19, Bandeira of Zhang modified teaches the orientation is selected based upon filters available to the radios within the access node (paragraph 0045, outbound and inbound transmissions are assigned to two non-overlapping channels on two distinct frequencies to ensure separation).

As to claim 20 with respect to claim 19, Bandeira of Zhang modified teaches the second radio and the first radio of each access node can be rotated between downstream data transmission and upstream data transmission (paragraphs 0045 and

0057, two or more transceivers or radios where each is assigned for outbound and inbound transmission in two distinct frequencies).

As to claims 21 and 22 with respect to claim 14 and claim 28 with respect to claim 20, Zhang of Zhang modified teaches each filter of the first filter bank has a corresponding complementary filter within the second filter bank if the first filter rejects frequencies of a desired pass band of the second filter and the second filter rejects frequencies of a desired pass band of the first filter (paragraph 0045 and 0051, the filters or channels of the FWNE radio units are appropriately selected for the FWNE/ access node to route or bridge the same or different channel network packets).

Claims 24-26 are withdrawn.

Conclusion

The prior art made of record and not relied upon but considered pertinent to applicant's disclosure includes Hornsby et al. (US 7,009,573), Bandeira et al. (US 6,728,514), Eastham (US 6,954,798), Dalal (US 6,819,943), Grob et al. (US 2005/0111383) and Widrow (US 2007/0173195).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Blane J. Jackson whose telephone number is (571) 272-

7890. The examiner can normally be reached on Monday through Thursday, 7:30 AM-6:00 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

